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Supporing Information

Zn-Doped In_2O_3 nanostructures: preparation, structure and gas-sensor property

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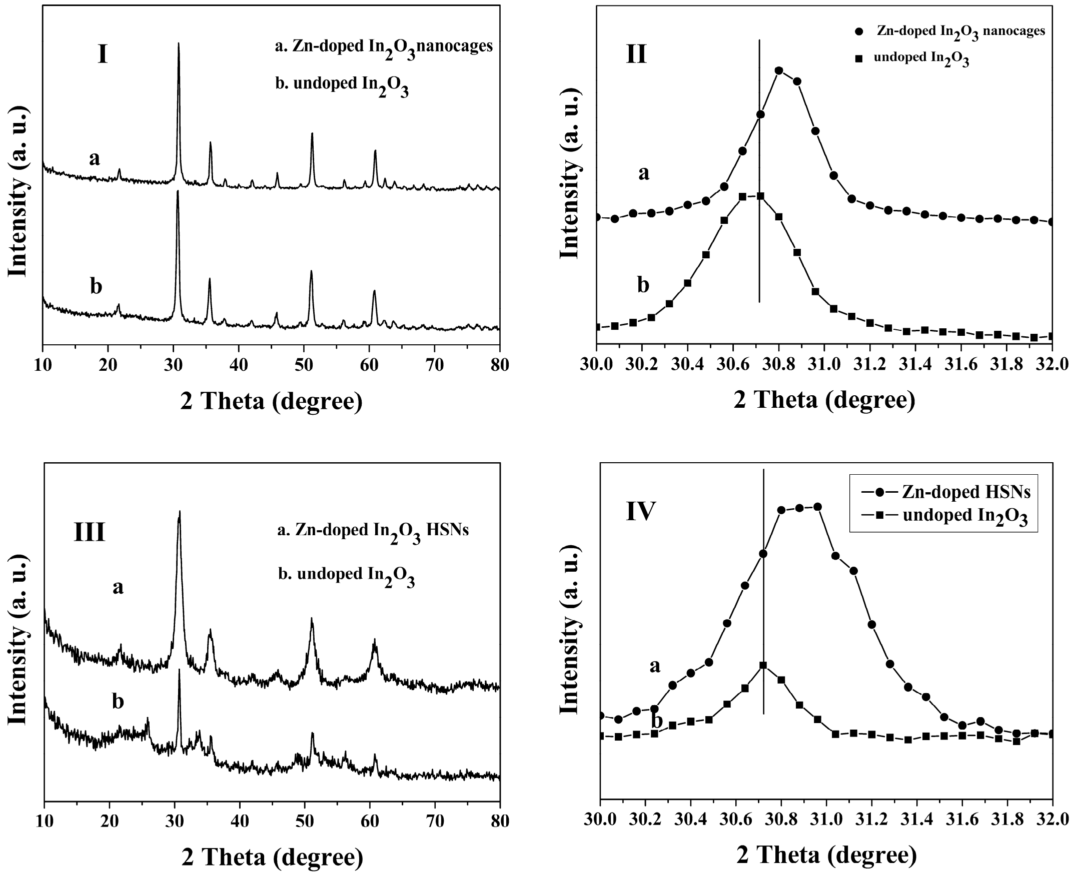

Fig. S1 XRD pattern, (I) taken from both Zn-doped nanocages and undoped In_2O_3 nanoparticles (II) enlarged view of the XRD patterns (III) Zn-doped HSNs and undoped In_2O_3 nanostructures (IV) enlarged view of the XRD patterns, showing a shift towards higher 2θ value in the Zn-doped HSNs.

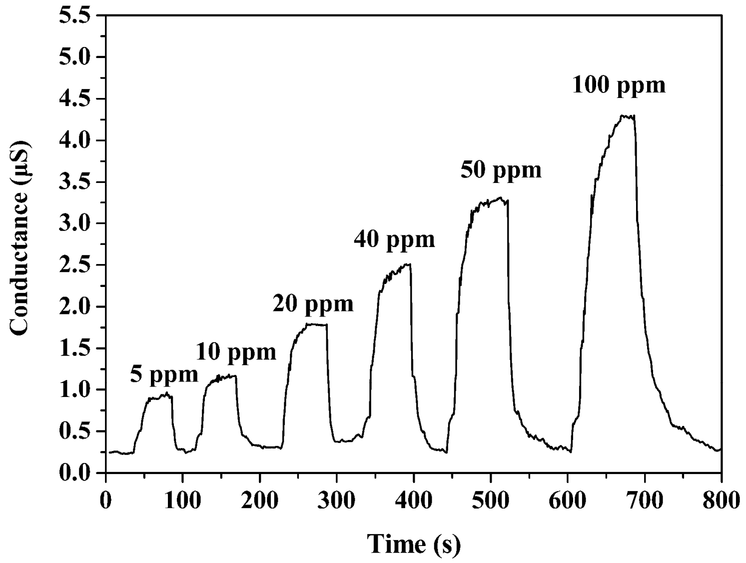

Fig. S2 Response curve of the undoped In_2O_3 gas sensor to formaldehyde with increasing concentration at an operating temperature of 260°C.

The relationship between formaldehyde concentrations and the response of the undoped In_2O_3 gas sensors in air at 260 °C is depicted in figure S1. Six different concentrations of HCHO, from 5 to 100 ppm, were detected and six cycles were successively recorded. By comparing these sensors, we find that the response of both the Zn-doped gas-sensors was much higher than the undoped sensors with fast response and recovery time, which shows that Zn-doped is playing a crucial role in enhancing the formaldehyde gas-sensor property. The main effect of doping in oxide semiconducting is the introduction of defects into the nanomaterials. And the increased crystal lattice defect of bulk oxide and the stronger electronic interaction between the detected gas and the surface active sites play an important role in enhancing the sensitivity in gas sensors.